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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/501,788	07/19/2004	Kiyonari Hashidzume	Q82000	6917
23373	7590	11/16/2006	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			TOSCANO, ALICIA	
			ART UNIT	PAPER NUMBER
			1712	

DATE MAILED: 11/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

*Supplemental*  
**Notice of Allowability**

Application No.

10/501,788

Examiner

Alicia M. Toscano

Applicant(s)

HASHIDZUME ET AL.

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 7/19/04.
2. ☒ The allowed claim(s) is/are 1-18.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some\* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date 2006 1108
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Jennifer Leach on 11/8/06.

The application has been amended as follows:

Claim 3 (Currently Amended). The film of claim 2, wherein in X-ray diffraction when X-ray is irradiated in a perpendicular direction of a cross section of the film, an orientation factor  $f$  which corresponds to a diffraction peak with the highest intensity among diffractions from the layered silicate satisfies the following formula (II):

$$0.6 \leq f \leq 1 \quad \dots(\text{II})$$

wherein

$$f = \frac{3\langle \cos^2 \phi \rangle - 1}{2}$$

$$\langle \cos^2 \phi \rangle = \frac{\int_0^{\pi/2} I(\phi) \cos^2 \phi \sin \phi d\phi}{\int_0^{\pi/2} I(\phi) \sin \phi d\phi}$$

$\phi$  represents an azimuthal angle (degrees), and  $I(\phi)$  represents diffraction intensity at the ~~direction~~ azimuthal angle  $\phi$ .

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Claim 5 (Currently Amended). The film of claim 2 or 3, wherein the shape of the cation-exchanged layered silicate observed from a cross section of the film satisfies the following formula (IV):

$$0 \leq \sigma(\angle A^*B D^*E) \leq 16 \dots (IV)$$

wherein A and B are points in one layered silicate and end points in a longitudinal direction of the layered silicate, A\*B is a straight line connecting the point A to the point B, D\*E is a reference straight line prepared on the cross section of the film,  $\angle A^*B D^*E$  is an acute angle ( $^{\circ}$ ) formed by A\*B and D\*E, and  $\sigma(\angle A^*B D^*E)$  is the standard deviation of  $\angle A^*B D^*E$  which is determined for 10 layered silicates with the first to tenth largest distance between the points A and B that are contained in an arbitrary cross sectional area of  $10 \mu\text{m}^2$ .

Claim 12 (Currently Amended). The composition of claim 11, wherein the layered silicate has the organic cation such that a cation exchange percentage (%) represented by the following formula (VI) is 50 to 200

$$\text{Cation Exchange Percentage (\%)} = \{W_f / (1 - W_f)\} / (M_{\text{org}} / M_{\text{si}}) \times 100 \dots (VI)$$

$W_f$  represents a weight reduction ratio of the layered silicate measured by a thermogravimetric analysis from  $120^{\circ}\text{C}$  to  $800^{\circ}\text{C}$  at a temperature increasing rate of  $20^{\circ}\text{C}/\text{min}$ ,  $M_{\text{org}}$  represents the molecular weight of the imidazolium ion, and  $M_{\text{si}}$  represents a molecular weight of the layered silicate per charge, where the molecular

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weight per charge in the layered silicate is a value calculated by a reciprocal of the cation exchange capacity, unit: gram equivalent or eq/100 g, of the layered silicate.

Claim 16 (Currently Amended). The silicate of Claim 15, which has the organic cation such that a cation exchange percentage (%) represented by the following formula (VI) is 50 to 200

$$\text{Cation Exchange Percentage (\%)} = \{W_f / (1 - W_f)\} / (M_{\text{org}} / M_{\text{si}}) \times 100 \dots (\text{VI})$$

$W_f$  represents a weight reduction ratio of the layered silicate measured by a thermogravimetric analysis from 120°C to 800°C at a temperature increasing rate of 20°C/min,  $M_{\text{org}}$  represents the molecular weight of the imidazolium ion, and  $M_{\text{si}}$  represents a molecular weight of the layered silicate per charge, where the molecular weight per charge in the layered silicate is a value calculated by a reciprocal of the cation exchange capacity, unit: gram equivalent or eq/100 g, of the layered silicate.

Claim 17 (Currently Amended). The silicate of claim 15, which has a thermal decomposition temperature of not lower than 310°C.

### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alicia M. Toscano whose telephone number is 571-272-2451. The examiner can normally be reached on Monday to Friday 8:30 AM to 5 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AMT



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